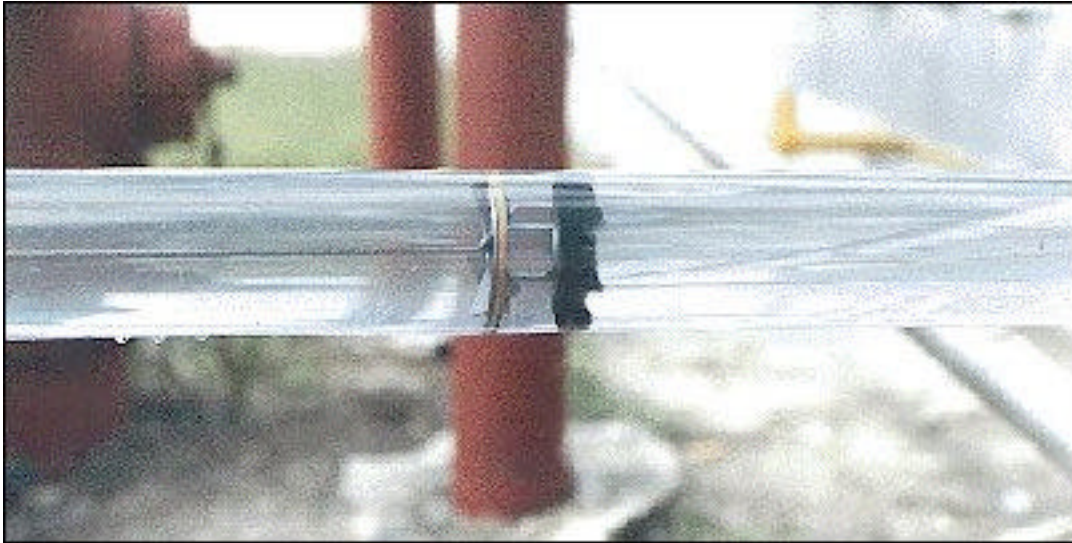


NASA Success Story

Turbine-Driven Brush Pipe Cleaner



A Florida company is marketing the Turbine-Driven Brush Pipe Cleaner, based on a NASA innovation. Titusville Industries, Inc., recently obtained a non-exclusive patent license from NASA's Kennedy Space Center (KSC). The pipe cleaner is designed to use hydraulic force to spin an internal turbine blade connected to a common brush assembly that rotates and cleans the inside of commercial and/or industrial pipes and tubes. The mechanism has the capacity to clean pipes or tubes at right angles and with 45-degree turns while using the force generated by the physics of water. In addition to the brushing action, the device provides even mixing of the cleaning solution. Titusville Industries is a tenant of the Florida/NASA Business Incubation Center (FNBIC). The FNBIC facilitated the license agreement between NASA and the company, and are providing support in their business development and marketing strategy for commercializing the product. Titusville Industries is developing a prototype 2-inch Turbine Blade/Brush Assembly that is being evaluated by the University of Central Florida's Mechanical, Materials & Engineering Department. The new design provides for a common shaft for mounting of the turbine and brush as a complete assembly. Once successfully tested, it could compliment the other designs and be used as an option for the assembly. The turbine blade has recently completed testing under the direction of NASA engineers and in coordination with the company. The innovation exceeded design expectations and has performed exceptionally well under strict testing procedures.

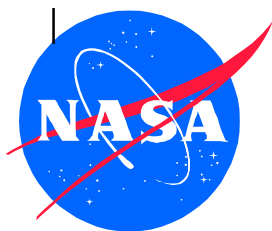
NASA Involvement The Turbine-Driven Brush Pipe Cleaner was developed and patented by NASA to provide a practical method to clean water lines and pipes that contain solvent residue that is compatible with water. It was designed to replace existing costly and time-consuming, pipe-cleaning processes. Kennedy Space Center has strict cleanliness standards for particulate, organic and

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NASA Success Story

Turbine-Driven Brush Pipe Cleaner (Continued)

chlorofluorocarbon cleaners, which may be harmful to the ozone layer. NASA's prototype consisted of a closed loop system with a 150 gal/min maximum pump. In a controlled test at KSC, it demonstrated an improved method of cleaning the inside of pipes and tubing, using a small turbine and bearing assembly utilizing upstream pressure of the water cleaning solution to spin a standard circular brush to clean the pipes. The fluid's flow powers the turbine brush, and a thin cable held upstream in tension controls brush position, thus eliminating mechanical drive cables or pressure lines used to power previous cleaners. The brush is pulled upstream by the cable, enabling the same pipe surfaces to be repeatedly cleaned without changing the fluid flow direction.

Social/Economic Benefit The Turbine-Driven Brush Pipe Cleaner has the potential to be used in several markets involving commercial fluids processing, including soft drink manufacturers, milk processing companies, water bottling companies, breweries, alcoholic beverage producing companies, and soup manufacturers. Applications exist in corrosion control in steam service lines, removal of marine organisms from seawater lines, and post construction cleanup of new pipelines. The product's main uses are primarily for preventative maintenance or light industrial cleaning. Facility requirements to run the system are 220-volt, 3-phase, ac power. The system is transportable in a standard pick-up truck bed. Also, a small demonstration system using a 1-inch diameter turbine brush and clear tubing is available from Titusville Industries. The company is also in discussion with a corporation that will provide a special material to be used to injection-mold the custom turbine impeller and brush assembly. The material is made from a mixture of recycled rubber tires and plastics that will help minimize tooling, manufacturing, and engineering costs, along with helping the environment.

Industry Partner

Titusville Industries, Inc.

NASA Partner

Kennedy Space Center

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